

WHAT IS CLAIMED IS:

1. A method for producing a high brightness light emitting diode, comprising steps of:
 - a) providing a temporary substrate for epitaxing;
 - 5 b) sequentially epitaxing an n-type cladding layer, an active layer with quantum well structure and a p-type cladding layer on said temporary substrate;
 - c) forming a p-GaP layer on said p-type cladding layer;
 - d) forming a metal contact layer on said p-GaP layer;
 - 10 e) etching a part of said metal contact layer, said p-GaP layer, said p-type cladding layer and said active layer, and an upper part of said n-type cladding layer to expose said n-type cladding layer ;
 - f) forming a p-type ohmic contact electrode and an n-type ohmic contact electrode on said metal contact layer and said exposed n-type
 - 15 cladding layer to complete a main structure of said light emitting diode;
 - g) bonding a glass substrate to an surface of said main structure on which with said electrodes are present;
 - h) removing said temporary substrate ;
 - i) forming a reflective mirror on a bottom surface of said n-type
 - 20 cladding layer;
 - j) bonding a permanent substrate to a bottom surface of said reflective mirror; and
 - k) removing said glass substrate.
2. The method as claimed in claim 1, wherein said temporary substrate is a GaAs substrate.
- 25 3. The method as claimed in claim 1, wherein said active layer is made from AlGaInP.
4. The method as claimed in claim 1, wherein said reflective mirror

is selected from the group consisting of In, Sn, Al, Au, Pt, Pd, Zn, Ag, Ge, Ni, Au/Zn, Au/Be, Au/Ge and Au/Ge/Ni, or mixtures thereof.

5 5. The method as claimed in claim 1, wherein said reflective mirror is a composite of high dielectric and low dielectric.

6. The method as claimed in claim 1, wherein said reflective mirror is a composite of dielectric and metal.

7. The method as claimed in claim 1, wherein said permanent substrate is bonded to the bottom surface of said reflective mirror by being previously coated an adhesive layer at a temperature below 350°C.

10 8. The method as claimed in claim 7, wherein said adhesive layer is a pure metal or an alloy with a melting point less than 350°C.

9. The method as claimed in claim 1, which further comprises a transparent conductive film between said metal contact layer and said p-type ohmic contact electrode.

15 10. The method as claimed in claim 1, wherein said p-type ohmic contact electrode is a transparent conductive film.

11. A high brightness light emitting diode, comprising:

a permanent substrate ;

a reflective mirror formed on said permanent substrate;

20 an n-type cladding layer formed on said reflective mirror, and defining a higher port and a lower port on an upper surface thereof;

an active layer with quantum well structure formed on said higher port of said n-type cladding layer;

a p-type cladding layer formed on said active layer;

a p-GaP layer formed on said p-type cladding layer;

a metal contact layer formed on said GaP layer;

25 a p-type ohmic contact electrode formed on said metal contact layer;

and

an n-type ohmic contact electrode formed on said lower port of said n-type cladding layer.

12. The light emitting diode as claimed in claim 11, wherein said permanent substrate is a silicon substrate.

5 13. The light emitting diode as claimed in claim 11, wherein said permanent substrate is a metal substrate.

14. The light emitting diode as claimed in claim 11, which further comprises an adhesive layer between said permanent substrate and said reflective mirror.

10 15. The light emitting diode as claimed in claim 14, wherein said adhesive layer is composed of a pure metal or an alloy with a melting point below 350°C.

15 16. The light emitting diode as claimed in claim 14, wherein said adhesive layer is composed of an organic adhesive with a low operation temperature and good heat dissipation.

17. The light emitting diode as claimed in claim 11, wherein said reflective mirror is selected from the group consisting of In, Sn, Al, Au, Pt, Pd, Zn, Ag, Ge, Ni, Au/Zn, Au/Be, Au/Ge and Au/Ge/Ni, or mixtures thereof.

20 18. The light emitting diode as claimed in claim 11, wherein said reflective mirror is a composite of high dielectric and low dielectric.

19. The light emitting diode as claimed in claim 11, wherein said reflective mirror is a composite of dielectric and metal.

25 20. The light emitting diode as claimed in claim 11, wherein said active layer is AlGaInP.

21. The light emitting diode as claimed in claim 11, which further comprises a transparent conductive film between said metal contact layer and said p-type ohmic contact electrode.

22. The light emitting diode as claimed in claim 11, wherein said p-type ohmic contact electrode is a transparent conductive film.